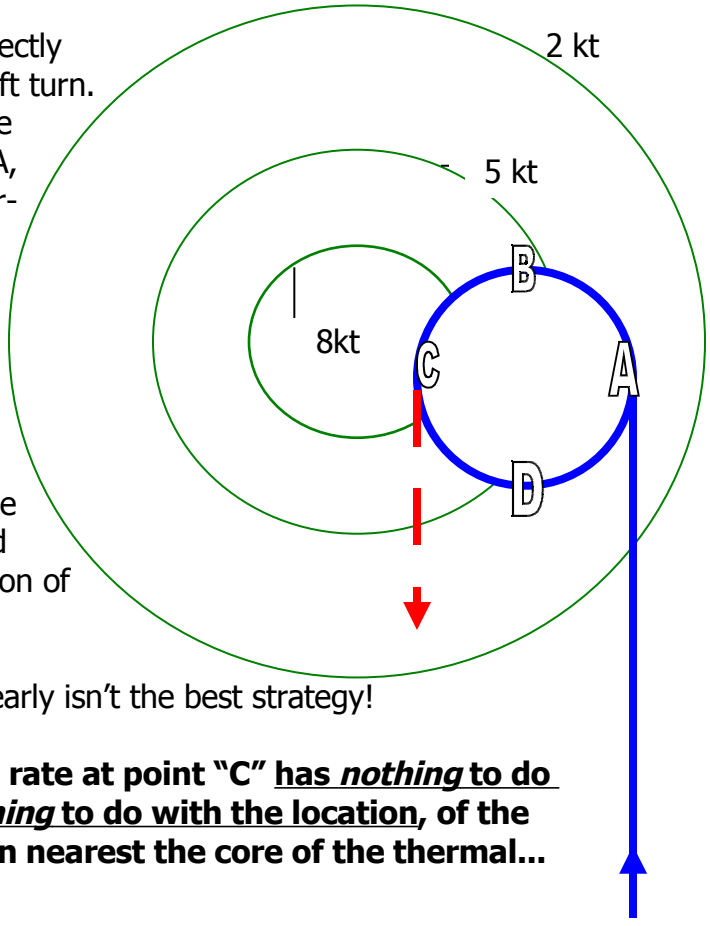
Thermal Soaring Technique: 90°/270° Centering Method

At a density altitude such as ours, a sailplane thermaling at 45 degrees of bank and 52 KIAS describes a circle with a diameter of approximately 700 feet. Were we to fly a straight line directly across the middle of this circle, it would take us about 6 seconds to do so. We'll use that fact later.

What we want right now is to find an easy, systematic method of adjusting the position of this 700-foot circle so as to maximize our rate of climb.

We <u>always</u> try to maximize our rate of climb because the thermal bubble will eventually pass us by—the bottom of it will reach our altitude—and we'd like to be as high as possible (or to have already departed the thermal) when it does.

Consider this diagram:



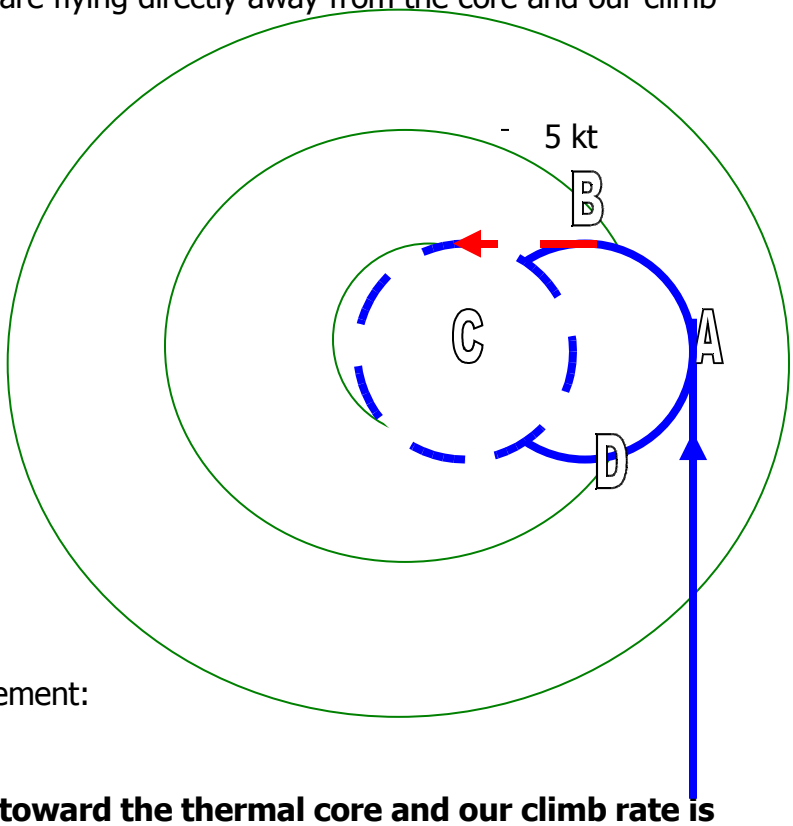
We flew into the thermal and correctly guessed that we should enter a left turn. As we continue this initial circle we pass successively through points A, B, C and D. At point "A" we experience the poorest climb rate; our climb rate improves as we pass through point "B," and peaks at point "C" before decreasing through point "D" and again bottoming out at "A."

Nearly all pilots, when enjoying the nigh climb rate at point "C," would roll out and continue in the direction of the broken arrow.

While this is understandable, it clearly isn't the best strategy!

The reason for the good climb rate at point "C" <u>has *nothing* to do with the heading</u>, and <u>*everything* to do with the location</u>, of the sailplane. We climb best when nearest the core of the thermal...

But let's talk about heading anyway... When we are at point "B" we are flying directly toward the core of the thermal, and our climb rate is increasing; when we are at point "D" we are flying directly away from the core and our climb rate is decreasing.



Let's emphasize that last statement:

At point "B" we are flying toward the thermal core and our climb rate is increasing; at point "D" we are flying away from the core and our climb rate is decreasing.

The best part of our original circle was at point "C" and we'd like to move the center of our circle toward point "C." The ONLY place along our path at which we are flying in the direction of point "C" is at point "B"—so the ONLY place for us to roll out and move our circle in the direction of point "C" is point B. Period!

Now that we've found--here in the classroom--the only place to roll out to make our correction and move our turn into the best lift, it remains for us to find an easy way to determine this point while in flight. There are two easy rules to remember:

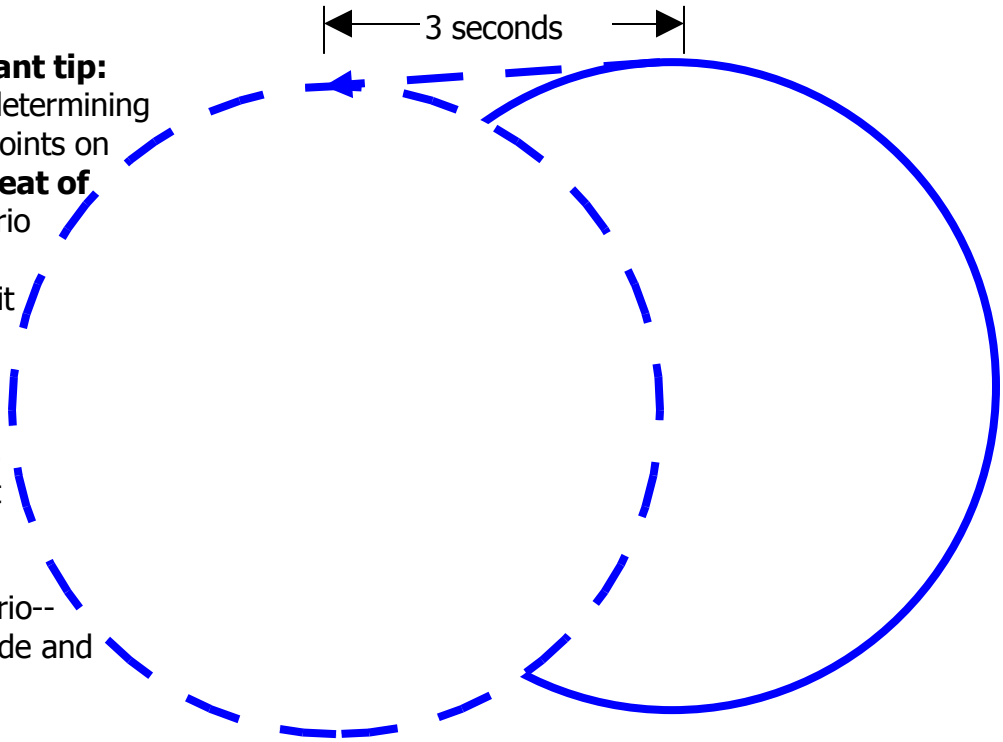
The proper place to roll out is 90 degrees after passing through the weakest lift, or 270 after passing through the strongest lift.

Why 270 degrees *after* the best lift? Simply because it's impossible to measure 90 degrees *before* the best lift: we just won't know it until we get there!

Many pilots have, at first, difficulty visualizing the 90-degree or 270-degree point. If this is difficult for you, here's an easy way to think of it:

When you're at the weakest point of the circle, the best lift lies in the direction of your inside wingtip; when you're at the strongest point of the circle, the best lift lies in the direction of your outside wingtip.

The ony question left to answer is, "After rolling out to make a correction, how long should the wings-level segment be?" Take another look at the diagram:



Here's an important tip: Don't forget--when determining the best and worst points on the circle**, use the seat of your pants**...the vario has too much lag because it has to wait until the sailplane accelerates upward. The seat of your pants directly senses this acceleration, not the vertical velocity!

Don't stare at the vario--keep your eyes outside and enjoy the flight.

We want to make a correction large enough to be worthwhile because we want to center our thermal quickly—yet at the same time we don't want to risk flying too far and losing contact with it. A nice compromise is to fly a wings-level segment just long enough that the new circle takes us right through the center point of the old one. If another correction is needed, we'll do it "next circle."

Remember that it would take us about 6 seconds to fly directly across the middle of a thermal circle—in other words, along a diameter of the circle. To fly just halfway across the circle, from the edge to the center, would take just half as long. So, here's our final rule:

Each correction should be about three seconds long.